

The Boston Medical and Surgical Journal

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April 28, 1921

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Worcester District Medical Society.

REGULAR MEETING, FEBRUARY 9, 1921.

SYMPOSIUM OF DENTAL INFECTIONS AND THEIR RELATION TO DISEASE.

I. THE VIEWPOINT OF THE ROENTGENOLOGIST. THE SIGNIFICANCE OF CERTAIN X-RAY APPEARANCES IN THE DENTAL ROENTGENOGRAM.*

BY FREDERICK W. O'BRIEN, M.D., BOSTON.

The certain x-ray appearances in the dental roentgenogram, of which there is here question, are those interpreted to mean, pericementitis, apical abscess, pus pocket, pyorrhea and necrosis. There is no controversy concerning frank osteomyelitis of the jaw with definite bone destruction, involucrum and sequestrum formation, nor of other pathological conditions of the maxillae as the cystic odontomata which are accepted as definite entities requiring operative interference. Of course, if you specify your granuloma as a simple cyst under the generic term, cystic odontomata, then the statement just preceding must be modified, since the granuloma is the much discussed apical abscess which, along with the others in the group above,

is believed to be definitely related to systemic infection.

The roentgenogram is essentially a shadow picture, a photographic image, registered by x-rays. It represents the relative values in light and dark tones of the radiability of the object in the path of the x-rays. Therefore, when in the roentgenogram you get a color value that is light in tone, it means decreased radiability. Wherever you get a color value that is dark in tone, that represents increased radiability.

The normal tooth structure and surrounding alveolar process presents the approximate appearances as seen in Figure 1. I want you to notice, with care, the apparent complete contiguity of tooth and socket. There is no color line of demarcation. Now look at Figure 2 and therein you observe a linear area of increased radiability that outlines the tooth socket. This linear marking is an actual change in color value. It is dark in tone and in a properly made x-ray negative can indicate only one thing, *viz.*, a linear area of increased radiability. It means the absorption of something. I know it is not the tooth proper, for that is present. It is not the alveolar process in this case, for that is intact. Since increased radiability signifies infection, chronic or subacute, the roentgenologist interprets this black line

* Read at the Annual Meeting of the New England Roentgen Ray Society, Boston Medical Library, Nov. 22, 1920.



FIG. 1.



FIG. 2

actually about the cementum to the pericementitis.

Now one may not see this black line outlining the entire tooth, but find it localized about the apex of a devitalized tooth with or without an incompletely filled root canal. If in the former case, you accept its pathological basis, then it should hold here. In fact, I believe, dental experience tells us that it is the x-ray film with very little, or only questionable evidence of pathology, from the clinician's viewpoint, that most often checks up with abscess findings on extraction. Linear changes at the apex must also be considered in another light. One must be certain that the angle used in the process of roentgenography is correct, for often the slight apical change may in reality (Figure 3)



FIG. 3.

be relatively great when properly represented.

Once this dark tone about the apex of a tooth is increased in size and is definitely circumscribed, then is one upon the royal battleground, for such is the x-ray image of what is commonly, but often erroneously, called, an apical abscess. There has been a great deal of talk about whether or not x-rays can show an abscess. The meticulous person argues an

abscess means pus, and the x-rays do not show pus. I am not so certain about that. I will agree that it is not always spelled out, p-u-s, in the roentgenogram, but I do know that the competent roentgenologist will note tone changes in the roentgenogram that denote the photographic representation of pus, or the result of pus processes.

This circumscribed area of increased radiability about the apex of a tooth, represents the absence of something, *viz.*, alveolar process, and often the tooth itself. Then there has been destruction from trauma or infection with pressure necrosis. Indeed, you do not have either process without pus.

If this area of increased radiability is homogeneous in color tone, black as opposed to white, with no x-ray evidence of the anatomical structure, then one is dealing with an abscess cavity (Figure 4), whose previous contents have



FIG. 4.

been absorbed, and which now is probably benign, all the more so if this area is encircled by a line of decreased radiability, light in tone, signifying a calcified, walled-off abscess cavity. It is these very abscess cavities that are called habitually abscesses, and often they are nothing of the sort.

Occasionally, the roentgenologist can, without question, demonstrate what can only mean one thing, if there is anything in this interpretation of color tones, and that is a definite active focus of infection, a granuloma or pus sack, which really contains abscess products. Figure 5 pictorially demonstrates this. In Figure 6, you will note the old walled-off apical abscess



FIG. 5.



FIG. 6.

cavity, a potential source of trouble, to be sure, and the apical abscess definitely an active source of trouble here and now.

At other times, one will see about the apex of a tooth on the x-ray film, an area of increased radiability that is not delimited and within which one can make out the anatomical architecture (Figure 7). This often has been called



FIG. 7.

necrosis. That is a very foreboding term. It may mean a very early change in abscess formation, or a senile atrophic condition or end process of nutritional disturbance. One should employ the term, "necrosis," with caution. There has been death, perhaps, microscopically, but I should be fearful to take upon myself the burden of reporting necrosis, if such a diagnosis were to be used as an attempt to justify a surgical procedure without very definite subjective and objective signs.

There is a parallel for my treatment of these circumscribed areas of increased radiability about teeth in the roentgen ray study of the lungs. Surely, there one can demonstrate walled-off abscess cavities, frank abscesses and abscess cavities partly filled with pus, to the satisfaction of even the uninitiated.

In other cases, this circumscribed apical area of increased radiability is absent, but extending down from the gum line on one or both sides of a tooth, may be seen a triangular-shaped area of increased radiability, dark in tone, but not as intense as that seen in the apical abscess cavity, because there has not been complete destruction of the alveolar process. Such areas are described as pus pockets. (See Figure 8.)



FIG. 8.

While there has not been complete destruction of the alveolar process, there has been atrophy with recession of the gum line, and some retraction of the alveolar process. This recession and atrophy, it is true, may be due to improper fillings, but one does not see the triangular area of increased radiability with the base line along the gum in pressure atrophy cases, but rather is there a retraction of the alveolar process, with little or no atrophy, and gum recession which is symmetrical. Were the roentgenologist to fail to report such appearances and their probable significance, he would be recreant to the patient, his consultant and to himself.

When the black line is present along with atrophy and retraction of the alveolar process, again indicated by areas of increased radiability, then does the x-ray negative portray the appearance of what we call pyorrhea (Figure 9).

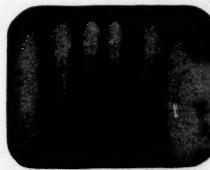


FIG. 9.

In conclusion, let me query what sort of a report should the roentgenologist render his consultant? Should it be a mere recital of the changes in radiability observed by him, e.g., a circumscribed area of increased radiability about the apex of such and such a tooth, or should it go further and be a completed judgment, in other words, an opinion, circumscribed apical area of increased radiability consistent with abscess cavity of long standing, or consistent with abscess and probable active source of constitutional disease. Only by rendering a diagnosis of the latter type, I believe, can the roentgenologist justify his medical training and experience. I do not think it is within

his province, however, to indicate to a dental consultant the method of treatment of the conditions found. However, he has the right and the obligation to point out what he finds, and believes to be pathological.

II. THE VIEWPOINT OF THE DENTIST.

BY FREDERICK A. KEYES, D.M.D., BOSTON.

UPON few specialties, in recent years, have the eyes of the medical profession and the laity been focussed with greater attention than on roentgenology and dentistry. This attention has been due, probably, to the increased popularity of the theory of focal infection. Unfortunately, however, at the present time, both roentgenology and dentistry are suffering from radicalism on the subject of focal infection which, though nourished in an atmosphere of ethics by high authorities in both professions, has carried with it an air of quackery.

It was to be expected that the advent of roentgenology should bring with it inadequately trained men whose sole object was to profit by mystification. Fortunately, this type is limited in number. The introduction of focal infection, I regret to say, has produced the same type of mystic in dentistry. A closer co-operation and understanding, then, between genuine roentgenologists and dentists will eliminate many of the present-day radicalists and faddists in both professions.

A graduate in dentistry is one whose special province in medicine is the care of the teeth and jaws. The activity of many of our dental and medical supply houses in selling their wares, such as x-ray outfits, blood pressure apparatus, stethoscopes, etc., to dentists, has created a type of man who is neither dentist, roentgenologist, rhinologist, nor physician. To quote from an article in a recent dental journal relative to the modern dentist and his prerogatives,¹ "His records should include blood-pressure readings, both systolic and diastolic, with the deducted pulse-pressure, blood count, with differential count and hemoglobin percentage, urinalysis, heart and chest sounds by auscultation and percussion, and the most complete bacteriological determination possible by means of stained smears from lesions, cultural growths and of a definite differential determination of the colonized organisms.

* Read at the Annual Meeting of the New England Roentgen Ray Society, Boston Medical Library, Monday, Nov. 22, 1920.

"The pulse, temperature and respiration should be charted, heart murmur and regurgitations noted, history of palpitation and dyspnoea on exercise, loss of weight, neurasthenia marked by malaise, lack of energy, insomnia, loss of appetite, and pain in the back, regional cephalgia and clinical or submitted history of opsialgia should be charted. The condition of the eyes with reference to purulent conjunctivitis, the condition of the ear with reference to foruncular or suppurative otitis, the condition of the stomach and bowels, and every clinical evidence which might be in any measure attributed to subacute infection should be noted and charted."

It would appear, then, that instead of practising one specialty, we dentists are expected to be specialists in *all* branches. If we do not feel competent to be a one-man hospital staff, we should at least own an x-ray outfit. I say, own, and merely own, for it is surprising to see how many x-ray machines are at present established as ornaments in the offices of some of our best dentists. In fact, we have an abundant supply of dentists posing as dental roentgenologists, exodontists, oral surgeons, etc., all, or one at the same time, as the occasion demands, whose sole training in roentgenology has been the supply house catalogue. The dental roentgenologist justifies his existence by the claim of greater familiarity with the anatomy of the parts, etc. Should not a surgeon, then, make the same claim with regard to the abdominal viscera and likewise become his own x-ray man? My contention, therefore, is that x-ray work is a specialty, that this work should be sacred ground and that no other branch of medicine has any right to trespass.

Let us now consider the various methods employed by some of our professional men in diagnosing dental disease and its application to the individual patient.

First, I would like to call to your attention the abandon with which the patients are referred for x-ray pictures. Many physicians and dentists believe that teeth should be x-rayed as a matter of routine, whether there is any physical indication or not. With radiograph reports for an excuse, thousands of teeth have been extracted from normal adults on the slight suspicion that arthritis, pyelitis, etc., may or may not be present. In fact, the patient may be enjoying splendid health today; but tomorrow, what may happen? Now to my mind, it

is poor logic to prophesy or prognosticate what a patient will suffer in ten or fifteen years. Furthermore, this theory is refuted daily in medical subjects with which we are more familiar than focal infection. In my opinion, patients should be referred for x-ray pictures only when there is some medical or dental problem to be solved and not for "snap-shot prognostications." More teeth have been slaughtered by medical and dental prophets, sheltered by the smoke screen of the x-ray, than have been lost by dental caries.

In spite of the danger of promiscuous x-ray interpretation, the dentist has no greater or more valuable aid in diagnosis than the x-ray, especially in checking up his root canal work.

In the presence of constitutional disease, where there is indication of toxic absorption, the x-ray is invaluable in helping proper dental diagnosis. On the other hand, the theory of focal infection is being over-played. "It must be remembered that an apical abscess does not always indicate constitutional disease any more than constitutional diseases indicate apical abscesses."²

In considering the teeth as a focus of infection, it must also be remembered that they are always primary foci, therefore, other primary foci, such as tonsils, sinuses, gall-bladder, genito-urinary tract, etc., should be carefully eliminated by the internist before the teeth are blamed.

Unquestionably, we have plenty of clinical evidence to substantiate the teeth as a focus of infection. Remember that the secondary foci may persist for months and years after the removal of primary foci, which may account for the many cases which do not improve. If we were as ready to publish reports of cases which show no improvement after the removal of primary foci of infection as we are to publish startling recoveries, we should probably not be suffering from the present day radicalism of false x-ray interpretation and radical extraction.

Oral surgeons, exodontists, and the great mass of common, every-day dentists, like myself, need conservative guidance in the proper interpretation of x-ray pictures from you men who have given your lives to this specialty. For example, a positive x-ray report of a pathological condition should mean that exactly. In other words, the roentgenologist should be very careful not to report *doubtful* pathological con-

ditions as positive. Radiographs should be made from enough angles to insure a complete report, so that the dentist may not be confronted today by a positive, and tomorrow by a negative report. In case of suspicions or doubtful pathological conditions it might be well for the roentgenologist to suggest a new radiograph at a later date, which might then insure a definite report.

It is, of course, unnecessary for me to warn you here against the old familiar misinterpretations, such as the shadow back of a second molar, caused by the coronoid process of the mandible, or that caused by the mental foramen, the anterior palatine foramen, the antrum or the vertebrae, all of which produce conditions which appear to be pathological.³

In making the report, the roentgenologist should remember that the omission of a word sometimes results in misinterpretation. For example, a roentgenologist reported a fracture case of mine to a physician thus:

"Mrs. X. shows perfect alignment of fracture, with no union." Now, as a matter of fact, I had removed the fracture appliance and the patient had been moving the jaw (chewing, etc.) for ten days without the slightest discomfort, showing that there *was* union (*i. e.*, fibrous union, which does not appear in the radiograph). This roentgenologist should have learned the history of the case from me and should then have reported "no *bony* union." The physician, not knowing the dental condition, immediately referred the case to another dentist to miraculously establish bony union.

The roentgenologist should also be most cautious in the use of the pathological terms, as necrosis, etc. I recently witnessed a radical antrum operation, the sole excuse for which was the wording of the x-ray report, with no clinical picture. The report of "granuloma at apex of superior left lateral, with extensive necrosis," afforded the operator an opportunity for a thorough curetting of healthy bone and an investigation of the area which carried him into a normal antrum. Right here let me say that most authorities agree that the antrum should *never* be opened intra-orally by a dentist, except under the direction of a rhinologist. Too many normal antrums have been needlessly explored because the roentgenologist has been too loose in an x-ray interpretation to a radical operator.

It so frequently happens that there is a wide

discrepancy between x-ray interpretation and clinical picture that it is difficult to determine the proper course of treatment. I hope that the time is not far distant when x-ray interpretation will become stabilized and thus, indication for proper dental interference assured.

Let us now consider, from the dentist's viewpoint, pericementitis, pus pockets, pyorrhea, chronic abscess and necrosis.

1. *Pericementitis.* This condition on the radiograph varies from a pencil line to the beginning of a so-called granuloma. It often shows on teeth with live pulp and has been a much-argued point between dentist and roentgenologist. I believe that this condition in the presence of a live pulp is benign. Where the pulp is devital and evidence of root canal treatment is present, it also means nothing except, perhaps, an old infection of short duration which should ordinarily not be disturbed unless in the presence of a severe constitutional disease. But if this condition (dead pulp, etc.) is accompanied by severe constitutional disease, extraction is generally indicated.

2. *Pus Pockets.* This has been the favorite advertising field for the "specialist." The term is a misnomer. From an x-ray viewpoint, this condition should be reported (to eliminate incipient pyorrhea, food pockets, improperly approximated fillings, etc.), but to label it as a really serious focus of infection is not substantiated by experience. Seldom have I obtained pus clinically from a so-called pus pocket. In fact, it is generally recognized that this condition is found only by the x-ray. Clinically, I have never seen a pus pocket which has given evidence of pus formation (pain, heat, redness, etc.). In fact, it would be impossible for this condition to exist without these symptoms some time or other. True, the pocket may be present, but with an outlet, and this free from the above symptoms, but it would be wrong to call this draining pocket anything but incipient pyorrhea. When this condition is reported by x-ray, and clinically I find good healthy gums, I discard it entirely.

3. *Pyorrhea.* This condition by x-ray is positive and shows structural changes in the alveolus. Clinical, likewise, it is positive. The two theories concerning this disease and focal infection are, first, that the pus is absorbed through the blood and lymph, and second, that most of the pus is swallowed and assimilated by the gastric juice, and that damage may or

may not result. In the presence of constitutional disease, where the clinical picture is positive, I feel justified in removing, by generally accepted dental standards, every tooth involved. The x-ray interpretation of pyorrhea, however, is so varied that it should usually be disregarded; for example, cases of so-called dry pyorrhea show very clearly in the x-ray, but clinically we find gums only slightly receded, no pus, and teeth firmly fixed. Even though the x-ray shows bone change in this condition, extraction is not indicated. Pyorrhea presents so true a clinical picture that the x-ray seldom aids either diagnosis or treatment. In cases of incipient pyorrhea, the x-ray may warn us of the need of careful clinical observations.

Alveotectomy and alveotomy, which are the latest cures for pyorrhea, are, to my mind, radical surgery, indicated neither radiographically nor clinically. A short time ago, I witnessed an alveotomy on a patient over 60 years old, under chloroform anesthesia for one hour. The operation consisted in burring necrotic bone which appeared only in the x-ray and the vivid imagination of the operator.

4. *Chronic Abscess.* This condition is a much debated one. When does a pericementitis cease, and a granuloma begin? Is the alveolar abscess walled off, an old process, or is it a definite active process? Is there a dead pulp present? Are the root canals imperfectly filled? Are there large fillings down in pulp chamber, with no evidence of pulp treatment? Is there constitutional disease present? In the presence of constitutional disease, I feel justified in extracting a tooth with a granuloma, except when the clinical picture indicates a live pulp. If there is no constitutional disease, dental treatment of the root canal is my procedure. Dr. O'Brien's differentiation between a chronic abscess and an abscess cavity is very timely. Whether or not abscess cavities are as benign as one group of men would lead us to expect, or as malignant as the radicals claim, is still undecided, but if a patient is referred to me by an internist with constitutional disease becoming progressively worse, I feel justified in extracting any tooth with a dead pulp, provided other primary foci of infection have been thoroughly eliminated. But in a patient of normal health, with no indication of constitutional disease, these roots should all be

treated, and the teeth saved, if clinically possible. It must be remembered that oftentimes, improperly filled root canals, with putrescent pulp, etc., with no x-ray evidence or clinical picture, there may be more pathology present than in a granuloma. Granuloma is often mis-called necrosis, and has been the cause of great confusion.

5. *Necrosis.* This term has been improperly used to define every shadow condition around the teeth. The clinical picture is almost always negative. The patient has pink, hard, healthy gums, no fistulae discharging pus, no evidence whatsoever, of real classical necrosis. Until we obtain some more definite information as to the real pathology of this so-called necrosis (thinning of bone), and until the clinical picture is optically positive, I never feel justified in opening into the jaw bone on the sole evidence of the radiograph. Many times, I have seen surgery done in these cases and have never witnessed necrotic tissue, sequestrum, pus, or, in fact, any of the expected sequellae of necrosis. In fact, healthy bone has been curetted and by some mysterious system of clairvoyance, the operator informs you he is removing "infected material." Indication of bone destruction, such as sound, touch, sight, and smell, are absent. But still, does not the x-ray show necrosis? We know that there is x-ray evidence of some change in the bone. But what this change is, is still a question. To call it necrosis opens an avenue for radical surgery, and is not substantiated by clinical findings. True necrosis, with sequestrum, pus, etc., show radiographically and clinically, and surgery is plainly indicated.

CONCLUSION.

This is a brief survey of the five pathological dental conditions which were chosen for discussion this evening. There are many other conditions, such as misinterpretation of unerupted teeth as impactions, exostosis of roots giving no trouble as pathological, harmless pulp stones, etc. The one point that I hope my paper has demonstrated is that the x-ray picture is of invaluable assistance in dental diagnosis, but the clinical picture is still the important guide for treatment, and that the genuine roentgenologist and dentist should have more frequent consultation, and the few, but

noisy radicals in our respective professions should be made to "walk the plank."

REFERENCES.

- 1 Lucas, Carl: Dental Summary, November, 1920.
- 2 Howe, P. E.: Lectures.
- 3 Miner, L. S.: Dental Cosmos, March, 1919.

III. THE VIEWPOINT OF THE BACTERIOLOGIST.

BY PERCY HOWE, D.M.D., BOSTON.

THE x-ray is used principally in dentistry in the search for what are called foci of infection. These foci, we are told, are points of entrance for certain bacteria into the system. From these points they are said to be conveyed by the blood and lymph streams to different parts of the body, where they are supposed to inaugurate disease. All the different effects of light and dark, as shown by the x-ray, are interpreted in terms of infection. All other pathological factors are ignored.

The principal infective agent that is regarded as the cause of diseases that are supposed to arise from areas about the teeth, is the short-chain, non-hemolytic streptococcus, called viridans. It is constantly reported that *S. viridans* is found in *pure culture* in these areas. The purity of these cultures may reasonably be questioned. Moreover, as Krumwiede says, "the term, 'Streptococcus viridans' is simply a term that applies freely to a large group of cocci, a group which is extremely heterogeneous in character. *Streptococcus viridans* is not a distinct type like the typhoid bacillus, all of which are alike." Also the type of bacterial life brought out by culture from areas of this kind about the teeth, depends on the media used and the method of cultivation. One kind of media may bring out streptococci, and another kind bring out an entirely different class of microorganisms. Neither necessarily approximate the nature of the conditions as they exist in the living body. At all events, the flora about the teeth is very varied. So far as the *S. viridans* is concerned, it is to be remembered that it is a normal inhabitant of the mouth. It is found in all healthy mouths, from infancy to old age. It is suppressed only during disease. It reappears with recovery. If it is the cause of dental troubles, all that is required is to inject it into the tissues about the teeth, when it should regularly produce the disease. When this is done, nothing but spontaneous healing

occurs. Many have tried this, but no one has succeeded in establishing a dental abscess, nor any condition that remotely simulates pyorrhea. How, then, can it be considered the cause of these troubles? In pyorrhea, a great variety of micro-organisms is found. The injection of any group or mixture of them is followed by spontaneous healing. No disease is established. Noguchi, in his study of the spirochetes of pyorrhea, says that they will not grow on healthy tissue. The ground for growth must be previously *prepared*. The cause of pyorrhea, is, he states, an anomalous metabolic condition. Kinsella says of the *S. viridans* that when constantly found in the blood stream and upon a *previously injured* heart valve, its growth seems purely saprophytic. On the other hand, it is possible to produce with regularity, a condition in animals that is very similar to pyorrhea, by feeding them a faulty diet. The infection is not then the governing factor in pyorrhea, but it is the tissue condition that governs the infection. This type of infection grows in areas of lowered resistance. It is a secondary factor in ordinary diseases about the teeth. Streptococci of this variety have, at one time or another, been thought to be the cause of many diseases, such as smallpox, whooping cough, scarlet fever, poliomyelitis,—only to be proved secondary invaders. The resistance of a part being lowered, the localization of the bacteria follows. They do not, then, without any reason, whatever, proceed in some cases from the teeth to the brain, causing insanity, and in other cases, from the teeth to the feet, causing fallen arches. If they are found in either of these parts, it is because the ground has been *previously prepared* for their growth. Not all areas revealed by the x-ray need be regarded as death-dealing centers; and wholesale extraction based upon this idea should be stopped.

One of the valuable things shown by the x-ray is the location of impacted teeth. These teeth often produce a marked nervous and vascular disturbance. This is of mechanical origin. Relief follows the removal of the tooth.

Abscesses about the teeth are no different from any other small abscess. With pus formation, the staphylococcus is usually present. These abscesses may be cured as readily as any abscess.

What has been called a granuloma may be an exceedingly small abscess undergoing repair or merely a thickened condition of the perioden-

tium. It is a walled-off, circumscribed affair, attached to the root-end. The alveolar bone in which it lies is often hard and polished. It frequently undergoes fatty degeneration and calcifies. The granulomas shown in textbooks are usually in an acute state. It is difficult to find bacteria in granulomas after sectioning and staining them. Occasionally, bacteria may be found, usually not. The bacteria seen in illustrations are usually brought out by culturing the tissue for several hours before sectioning. This, of course, does not represent conditions as they actually exist. The granuloma may be treated in many ways, and a closer filling of the bone about the tooth will occur. The removal of the tooth is not necessary.

In gouty patients, a thickening of the periodental tissues occurs, followed by an extensive calcification. This appearance, as seen in the roentgenogram, does not demand the extraction of the tooth. If the tooth is firm and of use, it should no more be removed than a gouty joint. This represents a local indication of a general calcium disturbance.

Many areas that have appeared in the roentgenogram have been found to be non-existent when cut down upon. Sir Kenneth Goadby gave many illustrations of this at his lecture in Boston. Considerable familiarity with dental pathological conditions and the possibilities of cure is necessary, before we condemn teeth too readily from x-ray evidence.

One of the most instructive things that the x-ray shows, is the bone-regeneration that follows treatment of these pathological areas. This requires time. Consequently, account should be taken of the time elapsed since treatment, before deciding that an abscess exists.

Often, small areas are seen about root-ends that are indicative of bone recession, due to slightly abnormal articulation of the teeth. Such areas are not necessarily infected.

The extensive use of x-ray machines by dentists means that much of this work is done by amateurs. This needs to be considered in the interpretation of x-ray findings.

IV. THE VIEWPOINT OF THE ORAL SURGEON.

BY KURT H. THOMA, D.M.D., BOSTON,
*Assistant Professor of Oral Anatomy and Pathology,
Harvard University Dental School.*

THE roentgen examination is one of the greatest aids in making a diagnosis of dental and

oral surgical conditions. It is important, however, not to overlook the clinical side, and I am opposed to the view held by one of the previous speakers that roentgen films should be made only by men whose practice is limited to roentgenology. It is true that many practitioners of general dentistry have not sufficient experience to interpret roentgenograms properly, but it is obvious that the dentist who practices roentgenology in connection with oral surgery, is equipped to give the best service, not only to the patient's physician or family dentist, but also to the patient himself. An examination of the medical roentgenologist is usually satisfactory if he has developed a careful technique, to give general information regarding impacted teeth or infection, but the finer details and recommendations as to methods of treatment can best be given by the roentgenologist who has made dental anatomy and pathology his special study, and by the oral surgeon, who has opportunities for comparing his diagnosis with the clinical findings of the operation.

Variations of the appearance of so-called abscess cavities in roentgen films have, to my mind, more to do with their anatomical location than with their pathological content. The defect in the bone consists, as is evidenced by examination of skulls,¹ of a cavity caused by bone destruction, with osteoporosis of the surrounding bone. The loss of bone is what is registered in a roentgen film. The size of a dark area around a tooth apex, therefore, depends on the size of the abscess cavity. The difference in shade and texture of its picture depends upon its location. If the outer or inner cortical plate of the bone has become perforated, we get a deeper shadow than from a cavity in the cancellous bone between the two thick, unaffected cortical plates of the mandible. Again, if the apex of the root is close to the surface, as is often the case with upper incisors, we may find only a shallow depression in the surface of the bone. This would give a very indistinct picture, and the structure of the underlying, cancellous part of the bone could probably be distinctly seen in the area on the film. In the upper bicuspid and molar region, it is important to keep in mind that often there is only a thin layer of bone covering the tooth apices, especially if the latter protrude into the maxillary sinus. The bone is not sufficiently thick for an abscess cavity to be formed and, therefore, we usually get very lit-

tle roentgen evidence of the infection. One kind of picture which is always typical is that of an incipient cyst. The dark area is surrounded by a distinct light line, representing cortical bone lining the cavity. Such cysts are developed from apical abscesses containing epithelium. When the lesion becomes larger, the roentgen picture gives exactly the same appearance, except for the difference in size.²

Acute and chronic conditions cannot be differentiated roentgenographically. It makes no difference whether the cavity in the bone is actually filled with pus or with inflammatory granulation tissue, as in a blind abscess, or granuloma. In an acute abscess, with the most violent symptoms, we sometimes get a decided picture showing an extensive area of bone destruction, while in other cases there is no roentgen evidence, on account of the fact that no extensive bone destruction has occurred, the pus having burrowed a small channel to the surface, accumulating under the periosteum and in the gum.

One of the most important features to diagnose in these cases of dental abscesses is the condition of the apex of the root. The tooth tissue, when surrounded for a long time by the abscess, becomes pus-soaked and forms an obnoxious foreign body, which can be best compared with a bone sequestrum. Microscopic examination shows that the small lateral apical foramina are filled with bacteria, and that absorption takes place,³ which can be recognized in a good roentgen picture. Evidence of such absorption indicates surgical treatment, either extraction or resection of the diseased part of the tooth, after careful sterilization of the rest of the root. This operation, however, is only indicated in selected cases in the anterior part of the mouth.

The writer believes that all teeth which give roentgen evidence of bone involvement are infected and, while the infection is generally latent, giving no symptoms, this does not mean that it is a negligible condition. There is a slow, but continuous formation of pus, and the only reason that the infection does not more frequently become evident clinically is because of the wonderful blood supply of the jaws and the prompt formation of a protective barrier. If, however, an additional burden is placed on the defensive system of the body, as, for example, in sickness or pregnancy, we quite frequently find that the chronic lesions become ac-

tive and acute. The result of local influences also bears out the same fact. A tooth with roentgen evidence of infection, which has given no symptoms for years, very often starts an active process when opened up, admitting oxygen, and the writer has observed three cases of blind abscesses, which probably had existed for years without the patient's knowledge, and which became suddenly acute from roentgen exposure during routine examination of the teeth. If used therapeutically this exposure would be considered a stimulating dose of roentgen rays. This all goes to prove that these conditions, giving no clinical evidence and recognizable only by roentgen examination, are unquestionably infections of latent character and important harbors of bacterial proliferation.

The relation of these conditions to systemic diseases is, of course, not in the scope of this short paper. I believe that dental conditions are very often the primary or contributory factors in diseases of the nose and throat and ears. Disregard of dental conditions in the treatments of infections of the maxillary sinuses is, no doubt, often a cause of poor results. Judgment is necessary, unbiased by radicalism and based upon careful clinical and roentgen examination of the jaws.

While it may be necessary, for purposes of local hygiene, for dental infections to be eradicated, the dentist should not make promises to the patient regarding systemic disease, of which he usually understands little. This should be left to the internist, who will also consider possible foci in other parts of the body and make a careful study of the general disease to decide what should be done for the patient. No doubt, removal of the original cause of a transported infection, though very important, is more a preventative than a curative measure, especially if the disease has become well established.

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1 Thoma, K. H.: Dental Diseases in Relation to Diseases of the Nose and Throat, Fig. 6, *BOSTON MEDICAL AND SURGICAL JOURNAL*, Vol. cixxix, No. 1, pp. 17 to 20, July 4, 1918.
2 Thoma, K. H.: *Oral Roentgenology*, Boston, Mass., M. C. Cherry, page 159.

*See Reference 1, Figs. 3 and 4.

THE MASSACHUSETTS ASSOCIATIONS OF BOARDS OF HEALTH will make the next meeting on April 28, 1921, a tribute to the life and work of Professor William T. Sedgwick, who has given unspareingly of his time and interest in making this association a power in public health work. Addresses will be given by Dr. E. R. Kelley, Professor George C. Whipple and President A. Lawrence Lowell.

Original Articles.

THE ENERGY CONTENT OF EXTRA FOODS. (SANDWICHES.)

(THIRD PAPER.)

BY CORNELIA GOLAY BENEDICT, BOSTON,
AND
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THE ready-prepared sandwich, consisting usually of two pieces of bread, with or without butter, with a filling either of meat, fish, salad, marmalade, jelly, or cheese, has become an important gastronomic American institution. Restaurants and drug stores, particularly, are meeting this demand by having these sandwiches already prepared in large variety. While sandwiches are, in many cases, to be sure, eaten as the regular noon lunch, the fact that they are usually conveniently wrapped in paper makes them especially useful for picnics and for automobile lunches, and consequently they are often eaten between the regular meals. The energy content of these sandwiches, because of their complex nature, is not readily computed from previously existing data, although it is obvious that a not inconsiderable amount of the energy must come from bread. We purchased, therefore, a large variety of sandwiches, subjected them to desiccation, and subsequently determined their heats of combustion in a bomb calorimeter.* All details with regard to the dealer, variety, price, weight and total calories, together with general comments, are given in the table herewith, in which the sandwiches are roughly classed as meat, cheese, salad, and miscellaneous.

It appeared evident at the start that there was a distinct tendency on the part of certain stores, particularly the so-called "chain" stores, to standardize more or less the sandwiches served over their several counters. As a partial check upon this, in three instances we purchased the same kind of sandwich in two different stores, but under the same central management. These instances may be noted from the first column in the table, where the dealers of stores under the same management are designated by the letters A, B, C, etc. With the rapidly shifting prices of the present day, it is

* We wish to express our appreciation here, as in our second paper, of the painstaking assistance of Miss Mary D. Flinn, whose skill and accuracy have made the accumulation of this material in large part possible.

SANDWICHES.

Dealer	Variety	Price	Weight of sandwich			Estimated calories in bread	Total calories in sandwich	Remarks
			cents	gm.	gm.			
<u>Mkt.</u>								
<u>A</u>	Corned beef	10	41	19	73	---	201	Thinly buttered.
	Do.	10	54	29	83	106	166	Do.
	Tongue	25	48	20	68	141	259	One slice buttered.
<u>B</u>	Sliced ham	10	48	20	68	126	192	Thinly buttered.
<u>C</u>	Do.	10	48	20	68	126	192	Both slices slightly buttered; ham covers whole slice.
<u>D</u>	Do.	20	48	20	68	126	192	One slice buttered.
<u>E</u>	Do.	10	52	18	70	59	185	Butter on one slice; ham not liberal.
<u>F</u>	Chopped ham and egg	10	44	44	88	122	232	One slice buttered.
<u>G</u>	Frankfort sausage	10	53	45	96	158	285	Mayonnaise; no butter; lettuce.
<u>H</u>	Do.	5	47	33	80	122	252	Round roll; one sausage; no butter.
<u>I</u>	Sliced chicken	30	25	11	77	77	239	Two slices bread; one sausage; no butter; mustard.
<u>J</u>	Do.	25	54	18	72	141	213	Roll; a little butter; mustard.
<u>K</u>	Do.	35	50	19	69	131	207	One slice buttered.
<u>L</u>	Do.	25	70	22	92	183	286	One slice buttered; generously.
<u>M</u>	Crab meat	25	25	11	91	---	221	Mayonnaise; lettuce.
<u>N</u>	Imported sardines	15	15	11	82	---	248	7 sardines; lettuce; no butter.
<u>O</u>	Sardine and Pimento	15	15	11	100	---	221	Mayonnaise; lettuce; little butter; 3 sardines.
<u>P</u>	Olive and cheese	15	15	11	80	---	190	Thinly buttered; piece of lettuce.
<u>Q</u>	Olive and cream cheese	10	10	5	62	172	172	Lettuce; not very liberal filling.
<u>R</u>	Cream cheese	10	10	5	55	141	201	
<u>S</u>	Do.	15	10	5	63	153	201	
<u>T</u>	Pimento	10	10	5	54	153	153	Lettuce; cheese on one slice; no butter apparent.
<u>U</u>	Young America	10	10	5	61	153	153	No butter.
<u>V</u>	American	10	10	5	57	200	200	Thin slice cheese.
<u>W</u>	Salad							
<u>X</u>	Egg	15	10	5	84	191	191	Lettuce; chopped egg; little butter or mayonnaise.
<u>Y</u>	Egg	15	10	5	72	201	201	Liberal mayonnaise; lettuce.
<u>Z</u>	Lettuce	10	10	5	91	322	322	Lettuce; little butter; liberal mayonnaise; about 6 shrimp.
<u>A</u>	Shrimp	20	20	5	125	379	379	Lettuce; little butter; liberal mayonnaise; lettuce.
<u>B</u>	Chicken	25	25	5	158	485	485	Mayonnaise; egg; pieces chicken; lettuce.
<u>C</u>	Salmon	15	15	5	74	214	214	Lettuce; mayonnaise; no butter.
<u>D</u>	Macaroni							
<u>E</u>	Peanut butter	10	10	5	60	216	216	One slice buttered; peanut butter not liberal.
<u>F</u>	Orange marmalade	10	10	5	78	240	240	Very little butter; fair amount marmalade.
<u>G</u>	Raspberry jam	10	10	5	67	189	189	No butter; not much jam.
<u>H</u>	Nut-bread				90	306	306	Little butter.

almost impossible to make a stable financial analysis of the economic value of these sandwiches expressed in monetary units, but the price at the time of purchasing (all were purchased within a period of 2½ months, *i.e.*, between January 22 and April 9, 1920, and consequently the relative price was probably the same throughout the entire period) is given and the subsequent economic computations are based upon the actual price as recorded. It is obvious that at the present date these prices may not obtain and probably the same materials could be secured only at a higher price, with the possible alternative of a stable price but a change in the size and contents of the several sandwiches. As can be seen from the price column in the table, the sandwiches ranged in price usually from 10 to 25 cents. Only occasionally were higher prices charged, and in one instance a Frankfurt sandwich was obtained for five cents.

Each sandwich was carefully weighed and its dimensions in millimeters recorded. Since there is a general uniformity in size, it seems unnecessary to give every individual measurement. Usually they were from about 97 to 100 millimeters square, *i.e.*, about four inches square, and about 25 millimeters, or one inch, thick. After the investigation was under way, it seemed desirable to attempt to secure some information with regard to the actual weight of bread and the weight of filling in the sandwiches. Hence for the meat sandwiches these data were obtained.

Perhaps the most popular sandwich is that filled with ham, closely followed in other seasons and other years by the tongue sandwich. On account of the condition of the meat market at the time of our investigation, it was practically impossible to obtain tongue, and only one sample of tongue sandwich could be purchased. Perhaps owing to the general affluence of the American public, there was a very heavy sale of the high priced sliced-chicken sandwiches. Simultaneously there was a development of the more complicated sandwiches, such as the salad sandwiches, and an increasing use of peanut butter, marmalade, and jelly as fillings.

The main object of the inquiry was to determine the total calories in the various types of sandwiches. With meat sandwiches, obviously, the total calories would vary considerably with the amount of fat in the meat and the amount of butter, if any was used, on the bread. Ac-

cordingly an attempt has been made (see column of remarks in the table) to give some rough indication of the amount of butter used. The meat sandwiches weighed from 59 to 100 grams, averaging not far from 75 grams, and the total calories ranged from 166 to 286, averaging not far from 225 calories. Special attention should be given to the Frankfurt sandwiches, which yielded approximately 250 calories and with a reasonable degree of uniformity. Referring to those instances when the same kind of sandwich was purchased of the same dealer on different days or from different stores under the same management, we find very closely agreeing results for the total calories in the two sliced ham sandwiches from dealer A, indicating reasonable uniformity in the standard composition; but with the two corned beef sandwiches purchased of dealer A and the two sliced-chicken sandwiches purchased of dealer D wide differences are noted. As stated before, however, it is possible that this may have been due to the proportion of fat in the meat.

The cheese sandwiches average somewhat less in weight and likewise somewhat less in calories than the meat sandwiches, containing not far from 170 to 180 calories. The variations in the total calories are so great, however, as to make an average figure only approximate. Roughly speaking, the number of calories is not far from proportional to the total weight of the sandwich, and when one considers that the larger proportion of the weight of a sandwich is bread, this is only what is to be expected.

The salad sandwiches present a special case. In the first place, they are practically all heavier than the average, the heaviest purchased being a chicken-salad sandwich weighing 138 grams, which likewise had the highest caloric content, *i.e.*, 485 calories. This is in large part due to the fact that there is usually a varying amount of fat-containing mayonnaise present, with, at times, butter. With the salad sandwiches, as with the cheese sandwiches, there is a tendency for the larger weight sandwiches to have the larger number of calories, although the presence of the mayonnaise is a factor that prevents making a direct proportion between weight and total calories.

Those sandwiches classified as miscellaneous weighed not far from 70 grams and contained from 189 to 306 calories, the latter value being found with the nut-bread sandwich and un-

questionably explained by the high heat of combustion of nuts.

Bearing in mind, in our discussion of the economic relations of these sandwiches to the calories they contain, that the prices obtaining at the time of purchase are subject to considerable variations, owing to the shifting scale of prices prevailing in America in the last few months, we can still see that in general, aside from the sliced-chicken sandwiches, the higher the price of the sandwich the larger the number of calories. With the sliced-chicken sandwiches, it is clear that the price is altogether disproportionate to the caloric content. The salad sandwiches containing mayonnaise are, for the most part, of a fairly high caloric content, but the data for the three specimens of frankfurt sandwich show that economically these provide the largest number of calories for the money expended of any, save one specimen of chopped ham and egg and one of lettuce salad. In connection with the Frankfurt sandwiches, it is of interest to note that almost exactly the same number of calories was furnished by one dealer for five cents that was supplied by two other dealers at twice that price.

The extent to which the American public is willing to go to pay for delicacy of flavor may well be illustrated by a more extended analysis of the data with regard to the sliced-chicken sandwiches. In three instances we weighed the meat separate from the bread. In one case we found that the total weight of sandwich was 69 grams, the weight of bread 50 grams, and the weight of meat 19 grams; in the second case the total weight was 92 grams, the weight of bread 70 grams, and that of meat 22 grams; in the third case, the total weight was 72 grams, the weight of bread 54 grams, and that of meat 18 grams. A sandwich, therefore, costing in the case of one specimen 35 cents, contained, roughly speaking, 50 grams of bread and 19 grams of sliced chicken, and yielded 207 calories. Computing the calories from bread by multiplying the weight of bread by the average value of 2.6 calories per gram of bread, we find that the bread alone yielded 131 calories while the chicken supplied 76 calories. At the time these purchases were made, first quality bread was selling in the market for 12 cents per pound, from which one can compute that the actual cost of bread in this sandwich was less than two cents. Consequently, disregarding the cost of labor and the conven-

ient but often illusive "overhead" charge, for 19 grams of chicken meat the purchaser paid about 33 cents, or at the rate of about \$7.70 per pound. Even with the other two sliced-chicken sandwiches, costing but 25 cents apiece, the estimated price paid for the meat is not far from the rate of \$5.00 per pound.

It is not, however, primarily in the economic side of the question that physicians are interested, but in the total caloric intake obtained by patients who eat sandwiches of this character, especially outside of the regular meals and under conditions which would not ordinarily be reported or seriously considered in the day's diet. It can be seen that the woman going to a tea shop and taking a cup of tea with a chicken-salad sandwich may easily obtain 485 calories in the sandwich itself, to say nothing of the calories obtained in the tea, sugar and accessories. The average lunch-counter sandwich of corned beef, tongue, ham, chicken, or cheese, yields not far from 200 calories, while the popular Frankfurt sandwich yields 250 calories. These amounts are by no means negligible. One can easily see that, on the one hand, a chicken-salad sandwich may legitimately be considered as constituting a fairly substantial lunch, while, on the other hand, if taken as an extra food, it is by no means without significance, particularly in cases of obesity. In general, the sandwich, aside from the Frankfurt sandwich, cannot be stated to be a particularly economic source of energy. A Frankfurt sandwich at five cents, however, is an economical source of energy at present prices. A sliced chicken sandwich at 25 cents or above can only be regarded as a concession to the demands of the palate and is not to be considered as an economic source of energy. The bread could much better be obtained by purchasing it separately at a few cents per pound, and sliced chicken, even of the first quality commonly used in chicken sandwiches, could hardly be offered for sale for as much as \$5.00 to \$7.00 a pound.

STEM-LENGTH AND TRUNK-LENGTH.

By H. GRAY, M.D., BOSTON,
AND
H. F. Root, M.D., BOSTON.

Reason for Considering Stem-length. Recently there have reached this country two foreign books by Von Pirquet and by Dreyer, which propose methods which may prove superior to

Bornhardt's rule for judging the normality of a person's body-weight. As neither of these authors mentions Bornhardt's method, much less makes comparative tests of it and his own formula, the following critical review is submitted, to be followed shortly by some observations and tests.

Literature on Stem-length and Analogous Terms. This conception of "body length" appeared at least a century ago when Cuvier, 1800, took the length in a straight line from the vertex (or snout in animals) to the anus.

Quetelet, 1871, recorded the measurement from the vertex to the "bifurcation (ereth?). Presumably, this corresponds more nearly to Cuvier's measurement than to any other, and is therefore intermediate in size between the measurement to the coccyx and the measurement to the ischial tuberosities (stem-length), with the sitting height the longest of the four.

A different measurement, nearly, but not the same, from the vertex to the first coccygeal vertebra, was considered by Quetelet, 1871, ("to the bottom of the vertebral column"), Tarentzky 1881, Henning 1881 (though he preferred the measurement, 7th cervical to the buttock), Kretschmann 1890 (it is not clear in his case and in the case of some others here cited, whether the landmark was the first coccygeal vertebra or the tip), Rollsen 1890, Dreike 1895 (who called the measurement to the first coccygeal "Stammlänge I," and the measurement to tip of coccyx "Stammlänge II"). It must be noted that neither of these is quite the same as the more recent "stem-length," which will be more extensively discussed below), and Terner 1919. For embryos, His 1904, recommended the use of the Scheitelsteisslänge (SS1), *i.e.*, from vertex to tip of coccyx.

The "sitting-height" was another measurement recorded by Quetelet 1871, (*vertex au pli qui forme la ligne de demarcation du haut de la cuisse sur la partie postérieure du corps*); this is probably nearly equivalent to the sitting height, for, according to Piersol 1908, "the fold of the nates or gluteofemoral crease . . . begins just below the level of the tuberosity of the ischium); and the level is supported by the fine illustration of Geyer 1902. The sitting-height (Sitzhöhe, or Si, for short) was also used by Peckham 1881 (who used the term, body height), Henning 1881, Toldt 1887 (vertex-breech in embryos), Sargent 1887, Bertillon 1889, Porter 1893, West 1893 and 1894, Smed-

ley 1900, Manouvrier 1902, Hastings 1902, Reuter 1902, Godin 1903 (who used both the terms sitting-height and "buste"), Boas and Wissler 1904, Ranke 1905 (who used the term, Sitzhöhe, but defined it as *Tubera ischiadica bis Scheitel*, *i.e.*, a measurement apparently identical with what was later termed stem-length), Godin 1910, Mall 1910 and 1918 (who preferred the name, crown-rump length, to vertex-breech and to sitting-height), Schuster 1911, Weissenberg 1911, Friedenthal 1914, Pfaundler 1916, Von Pirquet 1917, Holmes 1918, Keith 1918, Farabee 1918 (who also calculated an index resulting from division of the sitting-height by the stature, which we will abbreviate as Si/H, and which may well be useful later in utilizing the figures reported by others); by Hrdlicka 1919 (who, similarly, calculated the percentage of sitting height to total height), by Duckworth 1919, Schick 1919, Bardeen 1920, Streeter 1920, and by Boothby and Sandiford 1920.

The "trunk-length," for body-length, was defined by Meckel, 1828, as the bony skeleton without the appendages, *i.e.*, minus, not only the legs, but minus the head and neck, thus yielding the "central portion" of the body. The same definition has been given by such other noted anatomists as Sappey 1875, Henning 1881, Godin 1903, and Dwight and Piersol 1908 and 1919, though, from the latter's words, it is not quite clear but that "trunk" may be meant to include the neck vertebrae, but not the skull, *i.e.*, to correspond to the sitting height. Henning thought, indeed, that it would be better to omit the head and neck, because these vary so extraordinarily, especially in birds, and in all vertebrates measure from the 7th cervical to the Sitzhöcker (buttock). In the light of these, the recent use of "trunk-length" by Dreyer 1920, as synonymous with "stem-length," seems ill advised.

For measuring the trunk length, the upper limit has been quite generally given as the seventh cervical spine. Note the important statement of Dwight 1908, that, "the name vertebra prominens conferred on the seventh cervical is misleading, for the spine of the first thoracic is most prominent in that region." The lower landmark, on the other hand, has, unfortunately, not been always stated.

From the seventh cervical to the perineum was taken by Gould 1869, and Crampe 1872. From the seventh cervical to the "buttock" was preferred by Henning 1881 (though, as al-

ready mentioned, he also measured from the vertex to the perineum). Still another measurement, the "kleine (or partielle) Rumpflänge," or distance from the seventh cervical to the first coccygeal (and this, or possibly to the last coccygeal, seems the best interpretation for trunk-length, not including the head, as Dreyer does, in using the term synonymously with stem-length) seems to have been meant by Zeusing 1858, Aeby 1879, Lesshaft 1880, Topinard 1885, Blagowidoff 1886, Samson 1890, Rolssen 1890, Tichonoff 1894, Starkoff 1897, Bondyreff 1902, Ernst 1906, Weissenberg 1911, Gundobin and Debele 1912, Friedenthal 1914, and Pfaundler 1916. Another definition of "trunk-length," from the seventh cervical to the ischial tuberosities, was described as Rumpflänge by Ranke 1905, and has been recently studied by Lawrason Brown (unpublished), with the finding that this measurement comprises 70-72% of the stem-length.

A longer variety of trunk measurement was that proposed by Ravenel 1877: atlas to upper part of sacrum. Much the same distance was used by His 1882 and 1904, who measured in embryos what he called the Nackenlinie, the distance foramen magnum to rump. What seems to have been the same distance was called, by Geyer 1902, miscellaneous, the Rumpf, Stamm, Trunus, Torso, and "neck-breech," by Mall 1910. Similarly, Godin 1910, measured the spine (rachis) from tip of coccyx to occipital foramen (the surface landmark of which he regarded as the auditory meatus).

The corresponding anterior measurements of the trunk were made by Quetelet 1871, from top of sternum to "bifurcation," under the title "torse" (torso), but this seems of little use, because so widely varied by depth of respiration, and in fact has received little attention, except by Godin 1903 and 1910, who again made a slightly different measurement, from the incisura sternalis (sternion) to the os pubis (symphysis); and by Schwerz 1910, Friedenthal 1914 (Vordere Rumpflänge). Incidentally, the symphysis pubis seems a more definite surface landmark than the bifurcation, since, in the words of Piersol 1908, "the tip of the coccyx should be at about the level of the top of the symphysis; owing to the many variations of the former, however, its position must be uncertain." And, in fact, Geyer's beautiful diagrams show the tip of the coccyx at the level of the *bottom* of the symphy-

sis. This measurement may be derived by calculating the difference between Quetelet's figures for total height and height of top of pubic bone from the ground.

The length acromion to seat, called Rumpfhöhe im Sitzen, Schulterhöhe im Sitzen, was used by Reuter 1902, and similarly Bardeen 1920, defined the trunk length as: sitting height less distance vertex to acromion.

Oeder 1909, measured what he called "proportional-length," *i.e.*, twice the distance from the vertex to the middle of the symphysis, a distance, probably, most nearly comparable to the dorsal measurement from vertex to tip of coccyx (coccygion).

STEM-LENGTH IN DETAIL.

According to Walker. Without mentioning the "Stammlänge" of Dreike, 1895, and others, above cited, meaning vertex to first coccygeal vertebra, Walker, 1916, proposed the measurement from vertex to ischial tuberosities, and called this the "stem-length." His definition of the stem seems easier to measure and therefore worth quoting, on grounds both of priority and of concise clearness:

"By the term, 'length,' of the body is here meant the length of the stem of the body constituted by the head, neck and trunk; that is to say, the distance from the top of the head to the line joining the ischial tuberosities, or stem-length of animals, and was chosen as the first object for investigation in order that any results which were obtained in Man might be comparable with those obtained in other species.

"The length (1) is measured by seating the subject on the floor or on a low table (not a chair) with the back against the wall. Care is taken to see that the sacrum is in contact with the wall, and the legs somewhat drawn up so that the individual sits fairly upon his ischial tuberosities. Under these conditions, the height of the top of the head gives a true measurement of the length of the body, and one which is constant and incapable of variation by the subject. If a chair or other form of seat be employed in taking this measurement, the individual can, by 'sitting low' or 'sitting high,' produce, at will, a variation of as much as three or more per cent. But, since a subject, conscious that he is being measured for height, tends naturally to produce a full measurement, it will be found that he intentionally 'sits up,'

straightening the spine, tilting the pelvis forward, and rests on the contracted muscles of the thighs and buttocks instead of on his ischial tuberosities. The apparent length—‘sitting-height,’ as it has been termed,—is thus increased by between two and three per cent. above the measurement taken in the manner already described. Accordingly, measurements taken on a seat require to be corrected down appropriately before they can be treated as comparable with the measurement of body-length in infants or animals.” Walker took the mean of the two and three per cent. limits of variation which he noted, *i.e.*, two and five tenths per cent., as the amount to be deducted from the average sitting heights in Schuster’s 1500 Oxford graduates to obtain the true value of the average body-lengths for the groups. He also corrected for the clothes without boots, *i.e.*, the excess which Schuster included in his records.

The arguments for taking as the body-length the stem-length rather than the stature, may here be summarized:

1. A measurement permitting comparisons between man and other species (Walker 1916 and Pfaundler 1916).

2. The stature is an “impure measure” (Pfaundler, 1916), because of the unknown amount of compression of the intervertebral disks (also emphasized by Von Pirquet, 1916), of the unknown degree of the vascular and tissue turgor, of the varying fat layer in scalp and soles, of the variations in the angle of the trochanteric neck, and of the varying curves of the spinal column (also remarked by Von Pirquet, 1916), of unrecognized or unmeasurable pathological (rachitic, malacial) shortenings of the leg bones (W. R. Miles, 1920, unpublished).

3. Easier to measure than the old Stamm-länge, to the first coccygeal vertebra.

4. We may add, the avoidance, clinically, of the frequent procedure of allowing for the height of the heels, which vary in thickness more than the clothing on which the subject may sit.

Schuster’s Studies. Before proceeding to Dreyer’s work, it seems worth diverging for a moment to Schuster, 1911, whose figures for sitting-length were adapted for stem-length and discussed by both Walker and Dreyer. Schuster reported a statistical survey of the physical development of 1500 Oxford undergraduates, for which he cherished the noble ideal that it would

in itself have a permanent value as a record which might be compared with similar records obtained in other places and possibly in future ages. It is interesting in passing to note the observations which he recorded: Spot pattern test, acuity of vision, lung capacity, strength of pull, six head measurements, and (what interests us here) weight, total stature, and sitting height, though he did not use this term nor emphasize its probable significance. It is disappointing, however, to find that for our present purpose his records are not of value.

1. The chest-girth, already repeatedly urged in the literature by Allaire, 1863, and Bornhardt, 1886, to mention no more, was totally omitted.

2. As regards stem-length, he neither used the term nor measured that character. What he measured was the standing stature, the length of leg and the length of thigh, and, by difference, the “sitting height.” This character was found by Walker, 1916, on the average two and five tenths per cent. above what he called the true “stem-length.”

Dreyer and Hanson’s Work. Many ingenious ideas and practical tables for predicting weight are to be seen in the convenient little book published by Dreyer and Hanson in 1920. This represents the development of Dreyer’s 1919 article in the *Lancet*. Its most striking principle is the substitution of “stem-length” for the usual standing height. As to the manner of observation, these two authors gave, in 1920, the following directions, which seem a useful addition to Walker’s directions, already quoted.

“The subject places the backs of the fingers upon the platform on which he sits, and, with the fingers pointing backwards and the knees flexed, lifts the lower portion of the body gently backwards until the lowest bony portion of the os sacrum is in contact with the front of the measuring standard. The back is then straightened until the back of the head comes into contact with the standard. It will be found that different persons require to bend the knees in different degrees in order to achieve this position. The head should be tilted neither up nor down, and the eyes should look straight forward.”

In using Schuster’s figures on sitting height, Dreyer reduced them to stem-length (which he called “lambda”) by three per cent., which he had observed to be the more constant difference,

rather than Walker's two to three per cent.

In Dreyer and Hanson's book, the formula for predicting weight from stem-length (in males) was:

$$W \text{ (in kg.)} = 0.38052 \times \sqrt{\text{Stem-length (in cm.)}}$$

The work of previous students Dreyer dismissed with little further evidence than the curt statement that most of the existing tables dealing with the size of the normal human body were based on the theory of definite relations between age, height, and weight; while he believed that he had satisfactorily proved that such relationships do not exist when individuals varying widely in size are examined, and on the other hand, that definite relationships do exist between the weight of the body, the length of the trunk, and the circumference of the chest. Evidence for the validity of this statement he offered merely in the equally curt *ex cathedra* dictum that the data from which he and Hanson had calculated their tables were "derived from the analysis of a number of observations sufficient to insure a degree of accuracy that should prove entirely satisfactory." While it was not claimed that the constants employed for the various indices given in these tables were to be regarded as fixed and final, the claim was made that "any changes they may have to undergo in the future, as a result of the further accumulation of data, will be small and not likely to impair their present validity from the practical point of view." No test was published of the error of the new formula, much less comparison of this error with that resulting from the use of the methods previously proposed by others. Furthermore, the number of measurements which he actually reported, against which we can make such tests, comprised only sixteen subjects, i.e., a very small group. His data were obtained from men and boys who were "carefully selected on account of their physical fitness," though he did attempt to cover a widely different range in weight and height. These tests we have made and will report in a separate paper.

Owing to this important omission, one feels inclined, despite careful examination of his earlier work on a surface formula, first in relation to blood volume and then later in relation to vital capacity and to weight, and despite his originality and the superlative percentages, to agree for the present with the principles at

the root of the comment made on his 1911 paper by Boycott 1911, which follows: "It will, however, be observed that the wild animals used were even less representative than the tame animals dealt with in their earlier memoir (1910) . . . the largest animal in no case being twice as heavy as the smallest. While, therefore, their formula represents their experimental data in an extremely satisfactory manner, a good deal better, for example, than the method used above (by Boycott), I am still of the opinion that it is liable to be misleading when applied to individuals differing widely in weight from those investigated by them, and that their data are not sufficiently comprehensive to establish the general proposition that the blood volume of mammals is a function of the surface."

Similar reservations were made by Kisskalt, 1912, 1914 and 1915; and may be inferred from examination of textbooks on pharmacology published after 1914, i.e., subsequent to the articles by Moore and Dreyer. For instance, dosage according to surface, is not even mentioned in the manuals by Arny 1917, Wileox, 1917, Cushing 1918, Bastedo 1920. The only textbook found, referring to surface as an index, is that by Sollmann, 1917, which states that "other things being equal, the effect of a given dose is inversely proportional to the weight of an individual (exclusive of the adipose tissue). It is rarely necessary to make allowance for the weight in adults (twenty to sixty years), but it may be used for calculating the doses for children. Body surface is regarded by some as a more accurate, although less convenient, index of the dose (Moore, 1909; Dreyer and Walker, 1914); but the subject is in dispute (Kisskalt, 1915)."

The practical application of stem-length, in connection with the circumference of the chest, to the judgment of the normality of a person's weight, will be treated shortly in this journal.

We are indebted for aid in tracing references, to Miss M. E. Campbell of the Boston Medical Library.

IMPRESSIONS CONCERNING THE ETIOLOGY OF RICKETS AMONG THE ITALIANS.

BY BESSIE TALBOT STRONGMAN, M.D., BOSTON,

AND

HENRY INGERSOLL BOWDITCH, M.D., BOSTON.

[From the Boston Floating Hospital]

It was reported that rickets has become more prevalent recently among the Italian children of

Boston than heretofore. Statistics are wanting to substantiate this, and the statement would seem doubtful because of the recent tendency towards healthier children due to the Infant Welfare work. However, no one will dispute that there is a deplorable amount of rickets among the Italians, who, in their own country, are normally free from this disease. The handicaps of the rachitic are too well known to need comment. Prevention of the pelvic deformity in women would be of economic value to our nation. The problem seemed well worthy of investigation. The results of the short season's work would seem to indicate numerous contributing factors rather than any one definite cause. We are but submitting what we have found as impressions, with apologies for the incompleteness and lack of figures. The information has been gleaned from homes by personal observation and with the aid of interpreters.

If large families, crowded and dirty living quarters, lack of sunshine, or diet of low energy quotient, were either collectively or individually responsible for rickets, other races would presumably be equally afflicted. But the Hebrews and Poles are, for example, in spite of these very things, markedly free from rickets. There must be some racial way of life, in the case of the city-dwelling American-Italian, to account for the incidence. In our rural and suburban communities we find but little rachitic deformity among the Italians, as compared with that of the urban population. These people outside of the cities, doubtless get more green vegetables and potatoes and possibly more milk, and surely they cannot duplicate the living conditions of the tenements.

Generally speaking, we have found certain tendencies and habits fairly widespread among the Italians, although they vary somewhat according to the part of Italy from which the people came, and also with their social and economic status. Early marriages give a maximum child-bearing period. Little attention is given to prenatal care. The puerperium is notoriously of the ambulatory type. Nursing is unduly prolonged—first, as the only means of birth control available to the people of an Orthodox faith; and secondly, because of the economy and convenience and the desire to give the baby whatsoever it wants. There is but little discipline. The people truly love their children. With the prolongation of lactation,

pregnancy frequently occurs: this cannot fail to have its effect upon all three concerned. Unless the weaning is supervised by some social organization, it is usually abruptly to the adult diet, which is too highly seasoned and altogether unsuitable for children, besides the deficiencies which are to be discussed below.

Spaghetti, macaroni, and other similar products, and white bread are the main foods found on the tables; these are all of a highly milled wheat, lacking in vitamines. Today, all the macaroni on the market is of domestic manufacture as contrasted with pre-war times, when the greater part was imported (121,000,000 pounds from Italy in 1914). Macaroni (the term is used to include spaghetti, vermicelli, etc.) is being more widely used today than ever, because of the high cost of meat and potatoes. This American macaroni is from a flour which is entirely deprived of the vitamines. Analyses of macaroni would seem to show that formerly it more nearly approached whole wheat and the Grocers' Encyclopedia states that imported macaroni is approximately equivalent to middlings and therefore would contain bran. As summed up, American macaroni and white bread are not suitable unless supplemented with an adequate mixed diet. Moreover, we have found that the macaroni is frequently undercooked—the Dietetic Bureau and other workers corroborate this statement. Habitually the macaroni products are served with oil; this delays the splitting up of the starch until after the pancreatic and biliary secretions have removed the fat film. The starch, which forms the main item of diet, is therefore, we find, too highly milled, undercooked, and unwisely savored.

The fats employed are olive oil or the American cotton seed product substitute—the latter in an increasing amount. These are entirely deficient in the fat soluble vitamine. The animal fats are used only incidentally in the meats, which are sparingly used, and are in such small quantities as to be negligible. Milk is unpopular among the Italians—we found less than one cup per child in many households—cheese is used sparingly, and butter is not found. However, the milk stations report an increasing demand for milk in the North End district. A deficiency of fat soluble vitamines must be serious. The efficiency of cod liver oil has been demonstrated by the recent work of Howland, as reported at the last meeting of the American Pediatric Society (abstracted in *J. A. M. A.*,

July 17, 1920) and also in the recent relief work in the near East. We are greatly indebted to Dr. Percy R. Howe, who showed some interesting experimental animals at the Forsythe Dental Infirmary, which he has fed on a diet free of fat soluble vitamines. His work has been conducted primarily for the changes in the teeth. Incidentally, he has demonstrated bone decalcification with this diet and recalcification when the animal fat is supplied. We recall that the teeth of many of these rachitic children are very imperfect. He was unable to procure viable young from females who were on a deficient diet during pregnancy, but did produce rachitic offspring from some who had been on this diet up to the time of pregnancy.

As we have seen the diet in the homes we find a deficiency in vegetables and protein. Dietitians who work among the Italians are agreed to this. Meat, eggs, fish, and fresh vegetables are too expensive to be used. The minimum estimated cost of maintenance diet in August, 1920, for a family of two adults and three children was \$12.50 to \$15.00 per week (Dietetic Bureau, Boston, Mass.). The entire weekly budget of necessary expenses was \$28 to \$38 for this family. Many of these people have families which are out of proportion to the incomes. Where economy in food is practised, there is not only a tendency to low calories, but a great reduction of protein, iron, vitamines, etc.

The Italian mothers are very busy with their large families; frequently they do piece work in their homes. They cannot prepare individual dishes for the children. A single kettle of food, usually macaroni with some sort of vehicle, serves for the day's fare. They put into the kettle what they have in the house, not following any given receipt, and without regard to food values. The children are not trained to eat what is before them at regular intervals, but come and go as they please, eating what they want. We think that the younger children in large families are apt to be more rachitic than the older, increased maternal fatigue and crowding of the home, perhaps, being factors.

The housing is unfortunate. The rents seem quite out of proportion to the benefits—fully as much per square foot as in many of the better localities where janitor service is supplied, where there is at least one complete bath for each family, and where repairs are kept up. That the windows are kept closed by these peo-

ple from the first frost on throughout the cold weather is, however, not the fault of the landlords. Most of the children of the pre-school age are confined to the homes during the winter. A veterinary knows that puppies will not thrive if no sunshine reaches them, and we all know that sunlight is an essential for plant growth. The houses are very crowded. This is due, in part, to the boarders—the surplus of Italian men in this country without families. The Police Department of a nearby city enforces a rule that not more than four persons shall be permitted to occupy any one room.

It seems hardly fair to ask the Italian housewife to give up her Italian cookery for the detested oat meal, etc. It is hard to urge these thrifty people, who are saving diligently for a farm or a little shop, to spend more on food, but the following will show that these fairly representative meals are poorly balanced, and show certain deficiencies. These are taken from receipts gotten out by the Dietetic Bureau—actually more macaroni would be used with the same quantity of other ingredients. The calories show that these would serve only a small family.

POUNDS.					
	PROTEIN	FAT	CARBO-HYDRATE	ASH	CALORIES
1 lb. macaroni	.134	.009	.741	.013	1,605
1 lb. tomatoes	.012	.002	.040	.006	105
1 oz. oil		.063			242
2 oz. onions	.002	.0004	.012	.0008	28
2 oz. cheese	.034	.031	.0016	.0006	114
TOTALS	.182	.1054	.7946	.0104	2,154

POUNDS.					
	PROTEIN	FAT	CARBO-HYDRATE	ASH	CALORIES
1 lb. dry bran	.225	.018	.596	.038	1,605
2 lbs. potatoes	.044	.002	.418	.026	970
1 oz. oil		.063			242
6 oz. onions	.006	.0012	.036	.0024	84
1 lb. macaroni	.134	.009	.741	.013	1,605
TOTALS	.409	.0932	1.791	.0704	4,366

POUNDS.					
	PROTEIN	FAT	CARBO-HYDRATE	ASH	CALORIES
1 lb. rice	.080	.003	.790	.004	1,630
4 lbs. cabbage	.096	.018	.330	.06	870
½ lb. soup meat	.107	.040		.0045	370
TOTALS	.283	.061	1.126	.0685	2,870

Note.—If made with macaroni in place of rice, the values are practically the same.

We should learn to advise diets for the children which are known to Italian cooks and palatable to them. This would not be difficult for trained workers. The domestic science courses in the schools will be of inestimable value in

the next generation. Over the whole, one cannot but feel a subtle process of Americanization—possibly the feminist movement. We think that the Italians will adapt themselves to conditions as they exist here, that families will be limited by income and that eventually we will no longer see the rolling, rachitic gait; but we should do our utmost to tide them over until they have so adapted themselves.

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Book Review.

The Shibboleths of Tuberculosis. By MARCUS
PATERSON, M.D. New York: E. P. Dutton &
Co.

To anyone interested in the tuberculosis problem, this book is fascinating in the extreme. The title itself fills one with curiosity which is stimulated to a still higher pitch on reading over the titles of the fifty-nine short chapters. The following are typical examples: "That Sanatoria are no good," "That the Superintendent of a Sanatorium has a 'ushy' job," "That pine trees are necessary in the treatment of Tuberculosis," "That exertion causes Haemoptysis," "That a sea voyage is good treatment for Tuberculosis," "That good housing will eradicate Tuberculosis," etc., etc.

Throughout the entire book the very vivid personality of Dr. Paterson himself is strikingly in evidence, as is likewise his firm belief in the value of the opsonic index as taught by Sir Almroth Wright and in autoinoculation as carried on by Dr. Paterson himself.

There are several statements made by Dr. Paterson which will not bear analysis but which are none the less interesting reading. For instance, he devotes two or three chapters to prove that climate has no special value in the treatment of tuberculosis, and to support this argument quotes figures showing that the death rate for tuberculosis is higher in Colorado and California than it is in many more crowded parts of this country and of England. Dr. Paterson knows, and if he does not know, he certainly should know, that the cause for this increased death rate in the two above-mentioned states is to be found in the great influx of ad-

vanced and dying consumptives who are sent there in the vain hope of a cure. It is quite foolish of him, or indeed of anyone else, to maintain that climate has no value in the treatment of tuberculosis. Because, for instance, the incidence and death rate of tuberculosis in Egypt is high, doubtless due to the faulty hygiene and methods of living of the natives, does not prove in the slightest that the dry climate of Egypt is not good for certain cases of consumption.

He devotes a chapter to proving that haemoptysis is never caused by exertion. To those of us who during the past winter have been able, in our own minds at least, to explain satisfactorily numerous pulmonary hemorrhages by unwise exertion on the part of patients, such as the shoveling of snow or coal, his argument that exertion is no factor in the causing of such hemorrhages is not impressive. If he stated that in active ulcerating tuberculosis where the process is steadily advancing, and in so doing erodes a blood vessel, exertion or exercise is a factor of no moment, we would all agree with him, but he does not state this, although he doubtless believes it.

He is evidently a firm believer in blood inoculations into guinea pigs as a diagnostic measure. This has practically been given up in this country. As above stated, his infinite faith in the treatment of tuberculosis by autoinoculation is very evident, and he holds up to some ridicule a certain very prominent American physician, an authority on tuberculosis, who is an equally strong advocate of rest, and opposes autoinoculation in any form and graduated exercises as carried on by Paterson. The truth probably lies midway between the two extremes. He draws the distinction, which is a most important one, for those of us who live in New England to remember, that pure air does not necessarily mean cold air.

The book is full of epigrams and aphorisms. The following are good examples: "Changing a man's work is not treatment"; "It is not the diet that matters so much as the inducing the patient to partake of it"; "Fatness does not increase the specific resistance in tuberculosis"; "It is not the buildings of a sanatorium that matter, *but the man in charge of them*"; "Many homes for tuberculosis exist, but few sanatoria".

It is easy to go through this book and find many points with which to disagree. It would be difficult, however, to find a book which on the whole would be more refreshing and more stimulating than this one.

THE BOSTON Medical and Surgical Journal

Established in 1828

THURSDAY, APRIL 28, 1921

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Material for early publication should be received not later than second Saturday. Orders for reprints must be sent to the printer with gallon proof of paper. Upon written request, authors will be furnished free one hundred eight-page reprints, without covers, or the equivalent in pages in articles of greater length.

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Communications should be addressed to *The Boston Medical and Surgical Journal*, 126 Massachusetts Ave., Boston, Mass.

ACTIVITIES OF THE HARVARD CANCER COMMISSION.

CONSIDERABLE publicity has been given of late to the contemplated addition to the Collis P. Huntington Memorial Hospital for Cancer Research, in which will be installed a new type of x-ray apparatus.

The Huntington Hospital, it will be remembered, is directly under the management of the Cancer Commission of Harvard University. The Commission has been attacking the cancer problem from two widely divergent angles. From the clinical point of view, the Staff of the Hospital has been actively engaged in applying known methods of treatment to actual cases of cancer. This has been done largely by the use of radium emanation, combined, in many cases, with operative treatment. In the laboratories of the Commission, investigations have been carried on under the direction of Dr. Bowie, Research Fellow in Biology, bearing upon the fundamental facts of radiation. Investigation of the distribution of radiation about tubes of radium emanation, and the study of the heat-sensitization of paramecia to fluorite rays represent the type of work done in the laboratory.

Dr. Duane, Professor of Bio-physics, has developed, in his laboratory, an arrangement of apparatus which applies to the x-ray tube a constant difference of potential of 150,000 volts. This voltage produces x-rays which closely resemble the gamma rays (the hard, penetrating rays) of radium. These rays are able to penetrate living tissue much more effectively than the rays produced by the apparatus in general use, and at the same time with much less destructive effect upon the surface tissues. This new type of x-ray machine, which costs only about \$5,000, will be installed in the new wing of the Huntington Hospital. Inasmuch as it will supply radiation similar to that of radium, but in much greater quantity than is yielded by the amount of radium now at the disposal of the Cancer Commission, cases suitable for x-ray treatment can be much more effectively treated than at present, and at the same time much radium emanation will be freed for use in cases in which x-ray is unsuitable.

Unfortunately for these sufferers from cancer who might benefit from the increased facilities of the Hospital, the work upon the new wing has been greatly delayed by the strike in the building trades. It is impossible to say when the work will be accomplished.

The development of therapeutic measures against cancer, the most terrible of all ills which beset human flesh, encourages us to hope that some day we will not have to stand by, with hands tied, as is now so often the case, utterly unable to prevent the progress of the disease. The most important step in the management of the cancer problem is now and always will be, early diagnosis. The situation is well stated by Dr. Greenough, Director of the Cancer Commission, in the last annual report.

"As the study of cancer continues, the possibilities of a universal remedy for the disease diminish. The more closely the disease is studied, the more intimately is it found to be involved in the process of life itself. At the present time, the best program for the control of cancer demands the concerted action of many different individuals. The public must be taught to recognize the symptoms of early cancer and to present themselves promptly for examination. Physicians must be taught to recognize the disease in its early and curable stages, and facilities for operation must be made available for everyone afflicted with this disease."

MEDICAL NOTES.

BELGIAN PHYSICIANS IN AMERICAN EDUCATIONAL INSTITUTIONS.—Three medical men are among the twenty graduate fellows recently appointed by the *Fondation Universitaire* in Belgium to take advanced courses in American institutions of higher learning. They are: Albert de Galuwe, M.D., of the University of Louvain, who comes to this country to study abdominal surgery, and who was attached to the Belgian medical service in the war, being three times mentioned in despatches from the front, and winning the Belgian War Cross, Yser Cross, Victory Medal and Commemorative Medal; Albert Govaerts, M.D., University of Brussels, Secretary of the Belgian Eugenics Society, who desires to study eugenics, with the object of developing that science in Belgium; Henri Magos, M.D., University of Louvain, who comes to gain a closer knowledge of gynaecology and obstetrics, and abdominal surgery. Two of the four Belgian fellows of last year, who have been granted a year's extension of their study in the United States, are Jean Bigwood, from the University of Brussels, who is taking a course in internal medicine at Johns Hopkins, and Paul Martin, also from Brussels, who is studying surgery.

The twenty-four exchange American fellows to Belgium will be named by the heads of thirteen American universities and commissioned by the Commission for Relief in Belgium Educational Foundation, of which Herbert Hoover, Secretary of Commerce, is president. This organization, and the *Fondation Universitaire*, came into being at the liquidation of the Commission for Relief in Belgium, shortly after the armistice.

Forty-eight exchange graduate fellows are to be named each year. The American fellows may choose for the seat of their courses either the Universities of Brussels, Ghent, Louvain, Liège, the School of Mines and Metallurgy at Mons, or the Higher Colonial School at Antwerp. The Belgian fellows are free to attend any American University.

The American fellows must be citizens of this country and have a reading and speaking knowledge of French. They will be selected by the heads of the following universities: Harvard, Yale, Pennsylvania, Princeton, Columbia, Massachusetts Institute of Technology, Cornell, Vassar, California, Smith, Johns Hopkins, Chi-

cago, and Leland Stanford, Jr. They will be picked from one of these three classifications:

1. Members of the faculty below the grade of associate or full professor, including persons on leave.

2. Research students. Persons now or formerly enrolled, and holding a technical degree in their special fields, or who have had equivalent training.

3. Graduate students who desire to pursue some particular branch, and intend to adopt teaching or research as a profession.

Men and women are equally eligible as candidates for the fellowships.

MAN-MADE DISEASES.—Many of the diseases that afflict man may almost be said to be made by him, says the U. S. Public Health Service, for they are spread, almost altogether, by his disregard of the simplest rules of sanitary living.

Typhoid fever, for instance, is spread by the contamination of water, milk, and food, by human filth which has been run into rivers or wells, or left exposed for flies to carry to the kitchen or dining room, or which, even more disgustingly, is carried to food directly from soiled hands.

Hookworm disease and other intestinal diseases are spread, to some extent at least, by the states which allow road-building gangs to work under conditions which, too often, compel them to scatter pollution, to be carried by flies to their own kitchens or to be ground into the soil, to be picked up by the bare feet of the children. Practically all hookworm disease is due to soil pollution.

Malaria, too, is often spread by the ignorance and carelessness with which mosquito breeding places are created or disregarded. Barrow-pits, dug to obtain stone for road work and other needs, and left to fill with water, furnish homes for thousands of wiggler; culverts, improperly placed, produce pools that are equally prolific; ditches that are clogged, and never cleared out, are popular and populous; railroad and other embankments that stop or check the flow of water, create conditions that are ideal—from the mosquito point of view.

Dr. T. F. Abercrombie, health officer of Georgia, has suggested that the convict, and other gangs, who work along the roads, be required to fill up barrow-pits, place culverts

properly, clean ditches, and attend to other small but important details that any man can do, and that will deprive the mosquito of many of her breeding-places.

To accomplish this along the roads is more important than it may seem, for a mosquito, hatched at the roadside, does not have to wander in search of food; all she has to do is to wait for food to come to her. Moreover, if she is of the anopheline species, which spreads malaria, she has excellent chances both to acquire the malaria germs and to pass them along. Until she bites someone who has the disease, her bite, though no more pleasant than that of any other mosquito, is not any more dangerous. But a single malaria patient, driving along a ditch-bordered, mosquito-infested road, may provide hundreds of the insects with germs, which may pass on to every traveller along that road.

Dr. Abercrombie, by making the roads of Georgia safe for man, may materially reduce the malaria hazard of the State, and, according to the Public Health Service, his example deserves to be followed.

STATE LAWS CONCERNING CHILDREN.—In view of the number of states in which children's code commissions are at work, the U. S. Public Health Service calls attention to a recent report by the National Child Health Council, which recommends certain provisions that are apt to be overlooked.

Most important of all, it urges that all restrictions on local expenditures for the health of mothers and children should be repealed, and that definite facilities for the education of prospective mothers, their protection in industry, and the supervision of their health, should be definitely authorized.

The State Health Department should be authorized to license and supervise all midwives, and to require the immediate reporting of all inflammatory conditions of the eyes of the newborn and their proper treatment. Births, including still-births, should be promptly reported to local registrars under the Health Department. All maternity homes should be licensed and supervised.

Supervised pasteurization of all uncertified milk, and its proper handling, etc., should be required.

Health education should be provided for all school children. It should not prescribe rigid

or uniform drill or instruction, but should normally stimulate the child's physical development and should include practical instruction in personal hygiene, nutrition and sanitation. Teachers should be instructed in the fundamental principles of health education. Periodic physical examinations should be made. Special groups who are unable to receive class instruction, should not be forgotten. The sanitary condition of school buildings and grounds, and their environment, should be supervised.

The child in industry should be physically examined when he leaves school, when he changes his work, and periodically while he is of school age.

Each state should have a Bureau of Child Hygiene, which should administer the laws for children. All public and private institutions, having to do with children, should be subject to regulation by the health authorities. All appropriations for child or maternity care should provide specifically for health.

CHILD HYGIENE WORK OF GENERAL INTEREST.

—A report on a year's work in child hygiene, carried on by C. P. Knight, of the U. S. Public Health Service, in co-operation with the State Board of Health of Missouri, and with all private associations interested in the work, shows results of much general interest.

In sundry cities, a house-to-house canvass was made, to determine the percentage of birth registration, the sanitary condition of the home, the amount of milk used, the relative income, and the relation between prenatal influence and infant mortality. The parents were greatly interested in the work, and helped unhesitatingly. Better health supervision of young children, and the correction of much improper eating and sleeping habits resulted.

In other cities, school hygiene was begun by weighing and measuring the children. The results stirred up a friendly rivalry among the children, to see which could first reach the proper average. Many mothers attended talks given by Parent-Teacher associations, and learned that when a child was under weight (7 to 10 per cent. below average) and did not gain as he should (half a pound a month, between 8 and 12 years of age) it was probably due to some physical defect, or to faulty living.

With the mothers' consent, under-weight children were examined physically, and both child and mother were questioned in each

other's presence. Many physical defects and faults, such as late bed time and improper eating, were disclosed. Suggestions as to how the troubles might be rectified, were followed up by a public health nurse, who visited the homes and urged the remediable measures. Everywhere, both parents and physicians warmly cooperated in the work.

Rural school surveys showed that, though the country child had the advantage of fresh air and out-door life, he usually sleeps with closed windows, and subsists, especially in fall and winter, on pork, hot biscuits, gravy, and sorghum. In the summer, he has home-grown vegetables. Adenoids and decayed teeth pass unnoticed, or are neglected because of lack of facilities.

Demands from many parents that their children be weighed and measured, led to the opening of many child health centers, to which clinics for teeth, eye, and orthopedic defects were added. A community nurse began classes for mothers and expectant mothers, teaching them to care for themselves and for their babies. Follow-up work included monthly letters to expectant mothers and, later, a similar series on the care of the baby. By this means, interest in birth registration was aroused and data obtained for supplying it.

MENTAL DEFECTS IN SCHOOL CHILDREN.—"The prevention and correction of mental defectiveness," says the U. S. Public Health Service, "is one of the great public health problems of today. Its influence is continually cropping out. For instance, recent studies have shown that feeble-mindedness is an important factor in prostitution, and that a marked proportion of juvenile delinquency is traceable to some degree of mental deficiency in the offender.

"A recent state-wide survey in Oregon shows that more than 75,000 men, women, and children, out of a total population of 783,000, are dependents, delinquents, or feeble-minded, and that more than 500 school children, out of a total enrolled school population of 32,500, are more or less mentally deficient. The latter fact is significant when it is remembered that the condition of the children of today is the best possible index to the condition of the community of tomorrow.

"The Oregon figures are considerably lower than the average shown by the draft examination, indicating that they are certainly not

higher than those that would be obtained in other states."

MATERNITY AND CHILD WELFARE.—The following notice appeared in the London, England, *Daily Telegraph*, March 26, 1921, and is of interest to those studying problems referred to:

"In view of inquiries from local authorities and others interested, the Ministry of Health has issued a revised list, with index, of maternity and child welfare centres in England and Wales, including, for the first time, a list of day nurseries. The list contains the names and addresses of 735 centres and 140 day nurseries conducted by voluntary societies, and of 1,188 centres and 44 day nurseries conducted by local authorities. At about 150 of the centres, special dental treatment is provided, while others have special arrangements for eye and ear treatment. While the centres in the first part of the statement are primarily consultation centres for nursing mothers and children, under five, some are fully equipped for ante-natal consultations. There are now separate lists for residential and non-residential institutions.

"The Ministry advises that consultation centres should be reserved for healthy women and children, and that, where possible, treatment should be given at special treatment centres, which may be established at a hospital or combined with a school clinic, and may take cases from a number of consultation centres. The list has been specially looked forward to by maternity and child welfare workers, to whom, as well as to local authorities and others, it will be of great practical value, particularly in enabling them to refer mothers leaving their district to the appropriate centre in another district."

WALTER B. SWIFT, A.B., S.B., M.D., of Boston, now Instructor in Speech Correction in the Froebel League in New York City, has just been appointed "Lecturer on Speech Development and Correction" in the Northwestern University, Evanston, Illinois. He will begin summer courses there on June 27.

BOSTON AND MASSACHUSETTS.

THE DISTRICT NURSE BILL.—It will be unwelcome news to many to know that Chapter 40, Section 5, Paragraph 21, of the recent codification of state laws, provides as follows, under the specified amounts that towns may spend:

"For the employment of district or other nurses: but not more than two thousand dollars shall be appropriated for such in any one year." The restriction is known to apply to Brookline and Framingham, and, probably, many other towns which have expended larger sums.

Representative Bowers, of Framingham, has just introduced a bill under suspension of the rules, which is designed to correct the restrictive features of this law.

REGISTRATION OF NURSES.—In view of the great shortage of nurses, it will afford encouragement to report that two hundred and eighty applicants for state registration appeared at the examination held April 12 and 13.

The Board of Registration of nurses has encouraged all nurses to apply who can show evidence of graduation from any reputable school, and has postponed strict compliance with the regulations governing training schools until January, 1922. A special examination will be given June 28, although the law does not require one at that time.

WEEK'S DEATH RATE IN BOSTON.—During the week ending April 9, 1921, the number of deaths reported was 227 against 255 last year, with a rate of 15.63 against 16.45 last year. There were 29 deaths under one year of age against 42 last year.

The number of cases of principal reportable diseases were: Diphtheria, 56; scarlet fever, 62; measles, 131; whooping cough, 23; typhoid fever, 1; tuberculosis, 48.

Included in the above, were the following cases of non-residents: Diphtheria, 12; scarlet fever, 7; whooping cough, 1; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 3; scarlet fever, 3; whooping cough, 3; tuberculosis, 16.

Included in the above, were the following non-residents: Diphtheria, 2; scarlet fever, 2; whooping cough, 1; tuberculosis, 2.

Smallpox, 3 cases reported.

Leprosy, 1 case reported.

TEACHING HYGIENE AT THE M. I. T.—Under the direction of Professor C. E. Turner, M. I. T., Cambridge, a course in methods of teaching hygiene and public health is offered by the Massachusetts Institute of Technology.

Miscellany.

THE AMENDED TOWNER BILL.

We give below the text of the amended Towner bill.

It is quite evident that there is a growing interest in the question of maternal and infant welfare. This matter has, however, aroused much opposition, and the new draft seems to be free from many of the causes of contention found in the old bill.

Each state is free to accept or reject the co-operation features of this bill, and it does not seem to appear that a state must subordinate its interests. The reading of the bill seems to provide co-operation and not coercion.

Discussion of this measure is invited.

A BILL.

For the public protection of maternity and infancy and providing a method of co-operation between the Government of the United States and the several States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be appropriated annually, out of any money in the Treasury not otherwise appropriated, the sums authorized in section 2 of this Act, to be paid to the several States for the purpose of co-operating with the States in promoting the care of maternity and infancy in the several States, to provide instruction in the hygiene of maternity and infancy, and the sum authorized in section 5 for the use of the Children's Bureau for the promotion of maternal and infant hygiene, for the administration of this Act, and for the purpose of making such studies, investigations, and reports as will further the efficient administration of this Act.

SEC. 2. That for the purpose of paying the expenses of said co-operative work in providing the services and facilities specified in this Act, and the necessary printing and distribution of information in connection with the same, there is permanently authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$480,000 for each year, \$10,000 of which shall be paid annually to each State in the manner hereinafter provided. There is also authorized to be appropriated for the use of the States, subject to the provisions of this Act, for the fiscal year ending June 30, 1922, and annually thereafter, an additional sum of \$1,000,000: *Provided*, That the additional appropriations herein authorized shall be apportioned among the States in the proportion which their population bears to the total population of the United States, not including outlying possessions, according to the

last preceding United States census: *And provided further*, That no payment out of the additional appropriation herein authorized shall be made in any year to any State until at least an equal sum has been appropriated for that year by the legislature of such State for the maintenance of the services and facilities provided for in this Act.

So much of the amount appropriated apportioned to any State for any fiscal year as remains unexpended at the close thereof shall be available for expenditures in that State until the close of the succeeding fiscal year. Any amount apportioned under the provisions of this Act unexpended at the end of the period during which it is available for expenditure under the terms of this section shall be reapportioned, within sixty days thereafter, to all the States in the same manner and on the same basis, and certified to the Secretary of the Treasury and to the State agencies described in section 4 in the same way as if it were being apportioned under this Act for the first time.

SEC. 3. That the Children's Bureau of the Department of Labor shall be charged with the carrying out of the provisions of this Act, and the Chief of the Children's Bureau shall be the executive officer. The Chief of the Children's Bureau, as executive officer, is hereby authorized to form an advisory committee to consult with the Chief of the Children's Bureau and to advise concerning any problems which may arise in connection with the carrying out of the provisions of this Act, such advisory committee to consist of the Secretary of Agriculture, the Surgeon General of the United States Public Health Service, and the United States Commissioner of Education. The Children's Bureau shall have charge of all matters concerning the administration of this Act, and shall have power to coöperate with the State agencies authorized to carry out the provisions of this Act. It shall be the duty of the Children's Bureau to make or cause to be made such studies, investigations, and reports as will promote the efficient administration of this Act.

SEC. 4. That in order to secure the benefits of the appropriations authorized in section 2 of this Act, any State shall, through the legislative authority thereof, accept the provisions of this Act and designate or authorize the creation of a State agency with which the Children's Bureau shall have all necessary powers to coöperate as herein provided in the administration of the provisions of this Act: *Provided*, That in any State having a child welfare or child hygiene division in its State agency of health the said State agency of health shall administer the provisions of this Act through such divisions. The Children's Bureau may recommend to the State agencies coöperating under this Act the appointment of advisory committees, both State and local, to assist in carrying

out the purposes of this Act; the members of such advisory committees shall be elected by the State agencies, and at least half of such members shall be women, all of the members of which advisory committees shall serve without compensation. If in any State the legislature of which does not meet in 1921, the governor of that State, so far as he is authorized to do so, shall under the provisions of the law accept the provisions of this Act and designate or create a State agency to act in co-operation with the Children's Bureau. The said Children's Bureau shall then recognize such State agency for the purposes of this Act until the legislature of such State meets in due course and has been in session sixty days.

SEC. 5. That so much, not to exceed 5 per centum of the amount authorized for any fiscal year under this Act, as the Children's Bureau may estimate to be necessary for administering the provisions of this Act shall be deducted for that purpose, to be available until expended. Within sixty days after the close of each fiscal year the said Children's Bureau shall determine what part, if any, of the sums theretofore deducted for administering the provisions of this Act will not be needed for that purpose, and apportion such part, if any, for the fiscal year then current in the same manner and on the same basis, and certify it to the Secretary of the Treasury and to the several State agencies described in section 4 in the same way as other amounts authorized by this Act to be apportioned among the several States for such current fiscal year.

SEC. 6. That out of the amounts authorized under this Act the Children's Bureau is authorized to employ, to be taken from the eligible lists of the Civil Service Commission, such assistants, clerks, and other persons in the city of Washington and elsewhere, to purchase such supplies, material, equipment, office fixtures, and apparatus, and to incur such travel and other expenses as it may deem necessary for carrying out the purposes of this Act.

SEC. 7. That within sixty days after the approval of this Act the Children's Bureau shall certify to the Secretary of the Treasury and to each State agency described in section 4 the sum which the Children's Bureau has estimated to be deducted for administering the provisions of this Act, and the sum which it has apportioned to each State for the fiscal year ending June 30, 1921, and on or before January 20 next preceding the commencement of each succeeding fiscal year it shall make similar certifications for such fiscal year.

SEC. 8. That any State desiring to avail itself of the benefits of this Act shall, by its agency described in section 4, submit to the Children's Bureau for its approval detailed plans for carrying out the provisions of this Act. These plans shall include the provisions to be made in the State for the administration

of the Act the provision of instruction in the hygiene of maternity and infancy through public-health nurses, consultation centers, and other suitable methods. These plans shall be in conformity with the provisions of this Act, and reasonably appropriate and adequate to carry out its provisions. Due notice of approval shall be sent to the State agency by the Children's Bureau.

SEC. 9. That in order to provide popular non-technical instruction to the residents of the various States, particularly to those to whom such facilities are not accessible, on the subject of the hygiene of infancy, hygiene of maternity, and related subjects, the State agency described in section 4 is authorized to arrange with any educational institution for the provision of extension courses by qualified lecturers: *Provided*, That not more than 25 per centum of the sums granted by the United States to a State under this Act may be used for this purpose.

SEC. 10. That the facilities provided by any State agencies coöperating under the provisions of this Act shall be available for all residents of the State.

SEC. 11. That the Children's Bureau shall every three months ascertain the amounts expended by the several State agencies described in section 4 in the preceding quarter year. On or before the 1st day of January and quarterly thereafter the Children's Bureau shall certify to the Secretary of the Treasury the amount to which each State is entitled under the provisions of this Act. Upon such certification the Secretary of the Treasury shall pay to the State Treasurer as custodian the amounts so certified.

SEC. 12. That each State agency coöperating under this Act shall make such reports concerning its operation and expenditures as shall be prescribed by the Children's Bureau. The Children's Bureau may withhold the allotment of moneys to any State whenever it shall be determined that such moneys are not being expended for the purposes and under the conditions of this Act.

If any allotment is withheld from any State, the State agency of such State may appeal to the Secretary of Labor, and if the Secretary of Labor shall not direct such sum to be paid it shall be covered into the Treasury of the United States.

SEC. 13. That no portion of any moneys apportioned under this Act for the benefit of the States shall be applied, directly or indirectly, to the purchase, erection, preservation, or repair of any building or buildings or equipment, or for the purchase or rental of any buildings or lands.

SEC. 14. That the Secretary of Labor shall include in his annual report to Congress a full account of the administration of this Act and of the expenditures of the moneys herein authorized.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS.

FOR JANUARY, 1921.

General Prevalence.

There were 9,251 cases of communicable diseases reported during the month, an increase of 1,332 cases over the previous month's total.

Anterior Poliomyelitis.—There were but 10 cases during the month. This is the least number of cases that has occurred since June of last year, and probably marks the end of the epidemic of 1920.

Chicken Pox.—There were 1,454 cases this month, and 1,123 in December.

Diphtheria has increased slightly over last month, there being 965 cases reported, as against 943 in December.

However promising may be the outcome of the campaign of the Department for permanent immunization of children against this disease by means of toxin-antitoxin treatment, it is to be remembered that the result of this work will show in a lessened future incidence, and will not affect current prevalence. For control of outbreaks that have occurred, we must not forget our contacts (home, neighborhood and school). The most practical way in which the disease can be controlled by boards of health is by intensive work in locating the contacts of each case and culturing them to see if they are carriers or mild cases. If this method does not yield good results, the fault will be found to be from failure properly to pick the contacts; properly to culture them, or properly to isolate them (as well as the cases), during the time they have the organisms in their throats.

Epidemic Cerebrospinal Meningitis.—21 cases reported, compared with 28 in January, 1920, and 14 in December, 1920.

Measles.—An increase occurred, with 2,230 cases of the disease for January, against 1,876 in December.

Lobar Pneumonia prevailed in about the normal amount for this season of the year. This disease, however, is not yet fully reported. For instance, the fatality rate has been, uniformly, about 50%, based on case and death returns. This is much too high, and shows that all cases are not reported.

Scarlet Fever.—1,137 cases were reported in January, 1921; 1,714 in January, 1920, and 917 in December, 1920.

Pulmonary Tuberculosis.—590 cases in January, and 582 in December.

Typhoid Fever.—Only 38 cases were reported, which small number is not unusual in mid-winter.

Whooping Cough.—Not so many cases were reported as of measles. The number was 669. The disease is much more fatal than measles, and the amount relatively large.

Correspondence.

ON ADVANCING TELEPHONE CHARGES

Somerville, Mass., April 21, 1921.

Mr. Editor:—

The following letter of protest has been endorsed by the Somerville Medical Society and the Middlesex South District Medical Society at recent meetings. It was voted at the latter society to have the secretary notify all members of the date of the hearing when designated.

Yours truly,

H. E. BUFFUM.

Hon. William O'Brien,
Telephone and Telegraph Public Utilities Division,
State House, Boston, Massachusetts.

Dear Sir:—

The Somerville Medical Society, at their last regular meeting, appointed the undersigned a committee with full powers to notify those interested, of the proposed plan of the New England Telephone & Telegraph Company to increase the cost of telephone service to the physicians of Massachusetts.

The Company proposes to change the classification of the physicians from a residence rate, which has been in existence something over 20 years, to a business rate and, while technically there will not be a so-called change in rate, yet practically by the change in rating, all physicians will be compelled to pay much more for the service.

We know that the Company fully realizes that the present time would be inopportune for a general raise in rates, owing to the antagonism that would be presented throughout the state since the Company's recent advance of the dividend rate from seven to eight per cent. and the Parent Company (The American Bell Telephone and Telegraph Company) from an eight per cent. to a nine per cent. basis. Therefore, it seems that the New England Company hope to accomplish the same end by taking small numbers of subscribers and manipulating their ratings rather than their rates. The discrimination in making physicians pay business rates for a large share of the personal service while clergymen, other professions, and neighbors pay the residence rates for similar service seems hardly equitable, especially since residence rates for physicians have been satisfactory to the Telephone Company for so many years and was the Telephone Company's original proposal and position.

The Somerville Medical Society has authorized us to enter its protest to you against the action of the New England Telephone & Telegraph Company, and to ask for public hearing on the matter if said proposal of the Company is to be considered favorably by your Board. The Medical Society would be grateful for the courtesy if, in the event of a hearing, sufficient time is given us to arrange for the notification of the different medical societies throughout the state who have not already taken steps to protest to your Board, also to reach individual physicians through notice in our weekly *State Medical Journal*. We hope that the legal and personal representation of the fifty-five hundred physicians of Massachusetts at such a hearing will convince your Honorable Board that the proposal of the New England Company is unwarranted and untimely.

For the Medical Society,
EUGENE L. MAGUIRE, M.D.,
EDMOND H. ROBBINS, M.D.,
HERBERT E. BUFFUM, M.D.

[The profession should be immediately and actively interested in the above letter of protest relating to

the proposed rate of telephone charges. Each district society should arrange for cooperation in contesting this action of the company.—*The Editor.*]

EXAMINATION BY THE NATIONAL BOARD OF MEDICAL EXAMINERS.

The National Board of Medical Examiners will hold an examination in Boston, June 14 to 21, inclusive.

Subjects: Anatomy, Clinical Physiology, Physiological Chemistry, Pathology, Bacteriology, Material Medica and Therapeutics, Medicine, Surgery, Obstetrics and Gynecology, Hygiene and Sanitation. The certificate of the National Board is accepted as equivalent to a professional examination by the Federal Services and a large majority of State Medical Examining Boards.

Eligibility for examination: A four-year high school course, two years of acceptable college work, including physics, chemistry, biology and a modern foreign language; graduation from a Class A medical school, and one year as intern in an acceptable hospital or laboratory; application for examination will be considered from intern who had completed at least six months of intern service.

Applications should be made before May 25, to allow for proper investigation of credentials.

Information and application forms may be obtained from Dr. Horace D. Arnold, 520 Commonwealth Avenue, Boston. Dr. Arnold may be seen at his office from 4 to 5, Mondays, Wednesdays and Fridays, until May 25, or by appointment.

SOCIETY NOTICES.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.—Annual meeting will be held in Russell Hall, Y. M. C. A. Building, 40 Lawrence Street, Lawrence, (Tel. 1260) Wednesday, May 4, 1921.

Dinner will be served at 12.30 o'clock, sharp.

After the dinner, the business meeting will occur at 1.45.

Following the business meeting, adjournment will be had to the gymnasium, and two moving picture films will be shown by the Department of Public Health of Massachusetts (1 hour 35 minutes) entitled "Modern Diagnosis and Treatment of Syphilis" and "Diagnosis and Treatment of Gonorrhea in the Male." They will be introduced by H. A. Street, M.D., Chief, Subdivision of Venereal Diseases, A. A. Surgeon, United States Public Health Service, in a very short talk on the venereal program in Massachusetts, at which time questions will be answered.

This society has raised its full quota for social entertainment of the A. M. A., June 6-10, in Boston.

Meeting of the Censors will be held at Hotel Bartlett, 59 Main Street, Haverhill, (Tel. 8710) on Thursday, May 5, at 2 P.M., sharp. Candidates should present their diploma to the Secretary one week in advance.

D. D. MURPHY, M.D., President,
J. FORREST BURNHAM, M.D., Secretary.

HARVARD MEDICAL SOCIETY.—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, May 3, at 8.15 o'clock.

Program: Alastrim in Jamaica—Dr. W. G. MacCallum, Professor of Pathology, Johns Hopkins University.

MASSACHUSETTS GENERAL HOSPITAL.—A Staff Clinical Meeting was held in the lower out-patient amphitheatre on Monday, April 25, 1921, at 8 P.M.

The program: Adrenals—Dr. J. C. Aub, Assistant Professor of Physiology, Harvard Medical School. Dr. J. H. Means presided.

Doctors, nurses and medical students attended.